Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

CLASSIFICATION CONFIDENTIAL CONFIDENTIAL

CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT
CD NO.

50X1-HUM

COUNTRY USSR

SUBJECT Scientific - Medicine, species nonspecific serum

HOW PUBLISHED Monthly periodical

WHERE PUBLISHED Moscow

DATE PUBLISHED Jan 1950

LANGUAGE Russian

DATE OF INFORMATION 1950

DATE DIST. 4 Jan 1951

NO. OF PAGES 6

SUPPLEMENT TO REPORT

50X1-HUM

THIS DOCUMENT CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE OF THE UNITED STATES WITHIN THE MEANING OF ESPIONAGE ACT 50 U. S. C., 31 AND 32, AS AMENDED. ITS TRANSMISSION OR THE REVELATION OF ITS CONTENTS IN ANY MANNER TO AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW. REPRODUCTION OF THIS FORM IS PROHIBITED.

THIS IS UNEVALUATED INFORMATION

SOURCE Doklady Vsesoyuznoy Ordena Lenina Akademii Sel'skokhozyaystvennykh Nauk imeni V. I. Lenina, Vol XV, No 1, 1950, pp 16-19.

UTILIZATION OF THE BLOOD OF AGRICULTURAL ANIMALS: V. NITROGEN METABOLISM IN DOGS WHEN SPECIES NONSPECIFIC SERUM IS INTRODUCED INTRAVENOUSLY

V. V. Novosel'skaya
Moscow Chem-Tech Inst of Meat Industry
Submitted 1 Dec 1949

/This report gives additional information on the properties and applications of species nonspecific serum (VNS) prepared from the blood serum of cattle. The use of VNS serum for blood transfusions and for supplying parenterally additional protein nutrition in both human and veterinary therapy has been proposed./

The study of the physicochemical properties of species nonspecific serum, proposed by Academician N. G. Belen'kiy, showed that it contains from 5.5 to 8.2% protein and that the amino acid composition of this protein is very similar to that of the protein of human whole blood. It was also shown that VNS can be introduced into the blood stream of man and animals where it produces a very favorable effect similar to that of homogeneous plasma or serum. Since this was of great interest, a detailed study was proposed of the nitrogen metabolism when species nonspecific serum is introduced intravenously to show the serum's properties as a source of protein nutrition for the body.

To make this study, we set up, under the direction of Academician N. G. Belen'kiy, a series of experiments with dogs. The present article outlines the method and most typical tests used.

Each group of tests was preceded by a preliminary adaptation period (approximately 8 days) of feeding the test animals a definite food ration. The preliminary period had to last at least 3 days to establish a condition approaching nitrogen equilibrium, and to accustom the animals to the conditions of the test.

CONFIDENTIAL

CLASSIFICATION CONFIDENTIAL

STATE	X	NAVY	X	NSRB		DISTRIBUTION						
ARMY	X	AIR	X	FBI								

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

Throughout the course of the test, the amount of protein in the food was constantly checked (nitrogen in the dried food was determined by the macro-Kjeldahl method). Special attention was paid to the collection of urine, as the major quantity of endogenic nitrogen is excreted from the body in the urine. The urine was subjected to daily, clinical analysis, and the diuresis, specific weight, color transparency, and qualitative reaction for nitrogen were determined. When nitrogen was present, the amount was determined. For the collection of urine the dogs were harnessed with a special urine collector which consisted of a rubber tube and bottle. Specially adapted cubicles were constructed for the dogs with tile-covered floors with an opening through which the urine was drained into an aluminum pan. The nitrogen in the urine was determined by the macro-Kjeldahl method and then from this the daily amount of protein was calculated.

To judge the balance accurately, it was necessary to compute the amount of nitrogen excreted in the feces over the test period. The feces were dried in a porcelain dish over a water bath, ground up in a mortar, sifted, and the nitrogen determined by the macro-Kjeldahl method. We attached considerable importance to the nitrogen in the feces, since the quantity may vary for different individuals and under different conditions.

The investigation was made on 35 dogs in six series of tests, the character of the diet differing in various stages of the test. Within each series, there were instituted variations in the extent of protein and general starvation, size of the doses of serum introduced, number of injections, etc., and the sixth series was used as a control. To show the characteristics of the course of the test, we cite detailed data on three of them, one of the most interesting from each of the first three series.

The data arranged in Table 1 were taken from the first series. Over the course of 8 days, after a preliminary 6-day period of protein starvation, 6.1 g of protein in 100 cc of serum were introduced into this dog. Starting from the first day of the introduction of serum, and subsequently to the compensation of protein decomposition, the positive balance increased gradually; as a result of which there was nearly 100% assimilation of the protein.

In the second series, the tests were conducted on animals into which, during the course of a few days the subject serum was introduced intravenously in place of food protein, to establish the ability of the serum protein to replace meat protein. Daily introductions of the subject serum were given to various animals for periods of 6 to 25 days (Table 2). The data illustrate the relative utilization of the protein of the intravenously introduced serum and meat protein. The table shows that the meat protein ingested in the period preceding the introduction of serum is 40 to 50% assimilated at that time, while the protein of the serum, on the average, is utilized better than 100% [sic], and up to 70% of it is stored in reserve.

In the third series of tests, we studied the effect of single and multiple injections of the subject serum in different quantities of one-half, one, and two portions of the nutritive protein over 6-25 days (Table 3).

Data of this series of tests are distinguished particularly in that in addition to the growth of the positive balance, which continued at the same level throughout the whole test; we noticed that the quantity of nitrogen excreted in the feces was increased in relation to that of the preceding series of tests. This shows that the protein of the serum successfully fulfills the needs of the body.

Conclusions

1. The protein of species nonspecific serum, prepared from the blood of cattle, is a valuable source of protein nutrition, and has an extremely high biological value when introduced into the body by any method, particularly the

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

CONFIDENTIAL

50X1-HUM

intravenous, when it is almost completely assimilated.

2. The protein of the subject serum normalizes the nitrogen metabolism and reduces to a minimum the catabolism of nitrogen in the period following the introduction of the serum.

3. The excess protein of the subject serum is not excreted from the body, as food protein is, but it is deposited in the cell tissues and expended as needed. Therefore, the subject serum is an irreplaceable preparation for parenteral introduction in all disturbances of nitrogen metabolism where there is an urgent necessity for creating an effective reserve to make up a protein deficit.

/Appended tables follow./

CONFIDENTIAL

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

Table 1. Multiple Intravenous Introduction of Species Nonspecific Blood Serum after a Proteinless Diet (Dog No 4 "Levlysyy")

Period	Days	Wt (kg)	Introduced Protein During Day	Excreted Protein (g during day)			Balance of Protein (g during day)	
				In Urine	In Feces	Total	Total	Per Kg of Wt
Full-value diet (nitrogen equilibrium)	1	13	16.0	13.8	1.3	15.1	+0.9	+0.07
	2	13	16.0	13.6	2.0	15.6	+0.4	+0.03
	3	13	16.0	14.1	0.9	15.0	+1.0	+0.08
	4	13	16.0	13.9	1.4	15.3	+0.7	+0.05
Proteinless diet (period preceding introduction of serum)	1	13	0	9.2	1.9	11.1	-11.1	-0.85
	2	12	0	6.8	1.1	7.9	- 7.9	-0.65
	3	12	0	6.6	0.8	7.4	- 7.4	-0.61
	4	12	0	5.4	1.4	6.8	- 6.8	-0.56
	5	12	0	5.8	0.7	6.5	- 6.5	-0.54
	6	12	0	5.7	0.9	6.6	- 6.6	-0.55
Introduction of serum	1	12	6.1	5.4	2.4	7.8	- 1.7	-0.14
	2	13	6.1	3.6	2.2	5.8	+ 0.3	+0.02
	3	13	6.1	2.6	1.2	3.8	+ 2.3	+0.17
	4	13	6.1	2.1	1.0	3.1	+ 3.0	+0.24
	5	13	6.1	2.0	0.9	2.9	+ 3.2	+0.25
	6	13	6.1	1.1	0.6	1.7	+ 4.4	+0.34
	7	13	6.1	0.1	0.1	0.5	+ 5.6	+0.43
	8	13	6.1	0.1	0	0.1	+ 6.0	+0.46
Proteinless diet (period following introduction of serum)	1	13	0	3.1	1.1	4.2	- 4.2	-0.32
	2	12	0	3.9	1.9	5.8	- 5.8	-0.48
	3	12	0	5.0	1.7	6.7	- 6.7	-0.56
	4	12	0	4.4	0.8	5.2	- 5.2	-0.48
	5	12	0	3.3	1.5	4.8	- 4.8	-0.40

CONFIDENTIAL
CONFIDENTIAL
CONFIDENTIAL
50X1-HUM

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

Table 2. Multiple Intravenous Introduction of Species Nonspecific Blood Serum Instead of Meat Protein (Dog No 17 "Blagorodnyy")

Period	Days	Wt (Kg)	Introduced Protein During Day	Excreted Protein (g during day)			Balance of Protein (g during day)	
				In Urine	In Feces	Total	Total	Per Kg of Wt
Period preceding full value diet of meat protein	1	10	10.0	7.7	1.2	8.9	+1.1	+0.11
	2	10	10.0	7.1	1.3	8.4	+1.6	+0.16
	3	10	10.0	7.9	1.1	9.0	+1.0	+0.10
	4	10	10.0	7.4	1.9	9.3	+0.7	+0.07
Introduction of serum in place of meat protein	1	10	10.0	2.0	1.0	3.0	+7.0	+0.70
	2	10	10.0	1.7	1.1	2.8	+7.2	+0.72
	3	10	10.0	1.4	1.2	2.6	+7.4	+0.74
	4	10	10.0	1.1	1.0	2.1	+7.9	+0.79
	5	10	10.0	1.2	0.7	1.9	+8.1	+0.81
	6	10	10.0	1.3	0.6	1.9	+8.1	+0.81
Succeeding period of full-value diet	1	10	10.0	7.6	1.3	8.9	+1.1	+0.11
	2	10	10.0	7.9	1.5	9.4	+0.6	+0.04
	3	10	10.0	8.5	2.1	10.6	-0.6	-0.06
	4	10	10.0	8.2	2.5	10.7	-0.7	-0.07

CONFIDENTIAL
CONFIDENTIAL
CONFIDENTIAL
50X1-HUM

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0

Table 3. Multiple Intravenous Introduction of Species Nonspecific Blood Serum, With Full-Value Diet up to and at Time of Introduction (Dog No 9 'Ryzhik-Pushok')

Period	Day	Wt (Kg)	Introduced Protein During Day	Excreted Protein (g during day)			Balance of Protein (g during day)	
				In Urine	In Feces	Total	Total	Per Kg of Wt
Period preceding full-value nutrition (nitrogen equilibrium)	1	13	19.0	18.2	2.5	20.7	-1.7	-0.13
	2	13	19.0	17.1	2.1	19.2	-0.2	-0.02
	3	13	19.0	18.2	1.6	19.8	-0.8	-0.06
	4	13	19.0	17.3	2.1	19.4	-0.4	-0.03
Introduction of serum in place of meat protein	1	13	25.1	16.1	6.6	23.3	+1.8	+0.14
	2	13	25.1	15.3	4.9	20.2	+4.9	+0.38
	3	13	25.1	16.0	4.1	20.1	+5.0	+0.38
	4	13	25.1	15.4	4.7	20.1	+5.0	+0.38
	5	13	25.1	16.1	4.1	20.2	+4.9	+0.38
	6	13	25.1	15.1	4.9	20.0	+5.1	+0.39
	7	13	25.1	15.8	4.2	20.0	+5.1	+0.39
	8	13	25.1	15.5	4.6	20.1	+5.0	+0.38
Succeeding period of full-value nutrition	1	13	19.0	18.4	2.5	20.9	-1.9	-0.15
	2	13	19.0	17.5	2.4	19.9	-0.9	-0.07
	3	13	19.0	17.0	2.8	19.8	-0.8	-0.06
	4	13	19.0	16.3	2.5	18.8	+0.2	+0.02

CONFIDENTIAL

CONFIDENTIAL

CONFIDENTIAL

50X1-HUM

Sanitized Copy Approved for Release 2011/09/27 : CIA-RDP80-00809A000600370217-0